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| 10/506,602 | 09/10/2004 | Shahram Mihan | 257502US0PCT | 4911 |

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| ART UNIT | PAPER NUMBER |
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1764

DATE MAILED: 11/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|------------------------------|--|
| Office Action Summary | Application No. 10/506,602 | Applicant(s) MIHAN ET AL. | |
| | Examiner In Suk Bullock | Art Unit 1764 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 8-20 have been added. Thus, claims 1-20 are pending in this present application.

Withdrawn Objection(s)

Claim Objections

Objections to claims 1 and 5 are withdrawn in view of the amendment.

New Ground(s) of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Recitation of "pressure ranging from ambient pressure to 120°C" is indefinite because it is not known what the upper limit is for the pressure. Page 5, lines 28-29 of present specification also recites the same phrase containing the error.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 00/58319 (hereinafter "WO '319).

WO '319 discloses a process for oligomerizing alpha-olefins, for example 1-butene, with a catalyst system obtained from: (a) a chromium compound CrX_3 and a ligand L that is derived from 1, 3, 5-triazacyclohexane, for example 1,3,5-tri-n-dodecyl-1,3,5-triazacyclohexane or from a compound CrX_3L ; and at least one activator additive containing an alkyl aluminum compound, for example triethylaluminum and ethyl aluminum dichloride, and a boron compound, for example trispentafluorophenylborane. The ratio of chromium compound to boron compound is between 1:0.1 and 1:10,000. See Abstract; page 1, lines 6-27; page 4, lines 35-44; page 8, line 37 to page 9, line 3 and page 9, lines 45-46; and page 12, lines 4-19 and lines 32-38. The reference also discloses chromium compounds including CrCl_3 (page 7, lines 5-16), molar ratio of triethylaluminum to ethylaluminum dichloride in the range of 1-50:1, preferably 3-20:1 (page 10, lines 1-2), and molar ratio of chromium to alkylaluminum compound in the range of 1:0.1-500 (page 9, lines 38-47). The oligomerization is conducted at a temperature ranging from 1 to 120° C, at a pressure ranging from 3 to 120 bar (page 13, lines 5-10), and under inert gas such as nitrogen and argon (page 12, lines 45-47).

It is noted that the reference does not disclose alpha, beta or gamma branching in R substituents as instantly claimed. However, the reference discloses the same ligand formula as recited in the instant application and, therefore, would inherently have the same characteristic as claimed.

With respect to the claimed molar ratio of boron compound to chromium compound, the range disclosed by the reference overlaps with the claimed range. In the alternative that the reference does not anticipate the claimed range, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have determined the optimum molar ratio of boron compound to chromium compound to achieve most effective desired result.

With respect to the claimed molar ratio of chromium source to the alkylaluminum compound, the range disclosed by the reference appears to encompass the claimed range. In the alternative that the reference does not anticipate the claimed range, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have determined the optimum molar ratio of chromium source to alkylaluminum compound to achieve most effective desired result.

Response to Arguments

Applicants' arguments filed 8/23/2006 have been fully considered but they are not persuasive.

The argument that "there is no sufficient specificity or evidentiary support for a process that includes the combined features of the claimed invention" is not persuasive because the reference, in fact, discloses all the claimed components of the catalyst system. It is within the level of one having ordinary skill in the art to have been able to determine the most effective catalyst system to obtain desired results through routine

experimentation given the components of the catalyst system disclosed by the reference.

More specifically, applicants' argue that "only 1,3,5-tri-n-octyl-1,3,5-triazacyclohexane and 1,3,5-tri-n-dodecyl-1,3,5-triazachclohexane appear to overlap with any ligand according to the claimed invention. However, the majority of the ligands . . . of the reference have an alpha-branching or beta-branching or an alkyl residue having less than four carbon atoms." This is not found persuasive because as acknowledged by applicants the reference discloses the claimed ligand among others. A skilled artisan would have been able to determine the most effective ligand for the oligomerization process in view of the disclosure of the reference.

With respect to the argument directed to the activator, "Applicants note that the reference only describes an activator comprising a boron compound as an optional feature" is not persuasive because it is still a disclosure nevertheless.

The demonstrated superior result of the claimed invention is not persuasive because the reference has disclosed the components of the catalyst system. As stated above, it is within the level of one having ordinary skill in the art to have been able to determine the most effective catalyst system to obtain desired results through routine experimentation given the components of the catalyst system disclosed by the reference.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to In Suk Bullock whose telephone number is 571-272-5954. The examiner can normally be reached on Monday - Friday 6:00-2:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

J. Bullock
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